

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0135
Expires: January 31, 2004

SUNDRY NOTICES AND REPORTS ON WELLS PM 2 54
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

RECEIVED

SUBMIT IN TRIPLICATE - Other instructions on reverse side

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

2. Name of Operator

Black Hills Gas Resources, Inc. Contact: Lynn H. Benally

3a. Address

3200 N 1st Street PO Box 249 Bloomfield, NM 87413

3b. Phone No. (include area code)

505-634-1111 ext 27

4. Location of Well (Footage, Sec., T, R., M., or Survey Description)

Surface: SE/NE 2535' FNL 135' FEL- HES 291 Sec. 12 T30N R4W

Directional Bottom Hole SE/NE 2465' FNL 704' FEL

Bottom Hole: SW/NW 1980' FNL 660' FWL

5. Lease Serial No.

NMSF79484A and Fee Surface

6. If Indian, Allottee or Tribe Name

NA

7. If Unit or CA/Agreement, Name and/or No.

NA

8. Well Name and No.

Many Canyons 30-04-12 #24H

9. API Well No.

30-039-

10. Field and Pool, or Exploratory Area

East Blanco/Pictured Cliffs

11. County or Parish, State

Rio Arriba, NM

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

TYPE OF ACTION

☒ Notice of Intent

☐ Subsequent Report

☐ Final Abandonment Notice

☐ Acidize

☐ Alter Casing

☐ Casing Repair

☒ Change Plans

☐ Convert to Injection

☐ Deepen

☐ Fracture Treat

☐ New Construction

☐ Plug and Abandon

☐ Plug Back

☐ Production (Start/Resume)

☐ Reclamation

☐ Recomplete

☐ Temporarily Abandon

☐ Water Disposal

☐ Water Shut-Off

☐ Well Integrity

☐ Other

3. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

The initial APD dated June 15, 2006 to drill a Pictured Cliff (PC) was submitted to the BLM. Subsequently, BLM has reviewed and found that the surface location is a Non Standard Location (NSL) being only 135' FEL, instead of the minimum 660' off the section line. As a result of discussions with BLM, Black Hills Gas Resources (BHGR) is submitting an updated drilling plan, a new C-102, and a revised NM State Form C-101, to directionally drill the initial well casing to a distance of 704' FEL and then kicking off the horizontal leg. This will allow BHGR to have a footage of 704' FEL instead of the initial 135' FEL.

The surface location of the well remains the same but the directional bottom hole will be SE/NE 2465' FNL 704' FWL. The horizontal bottom hole will remain the same but the kick off point and the overall horizontal bore length will change.

Terminal pt. of the lateral @ $\pm 1980' N + 660' W$ Sec 12
Surface disturbance will not change from the initial APD, therefore the Surface Use Plan will not be updated or modified.

FEL (2nd KOP)

HOLD C104 FOR directional Survey

plan will require NSL for Lateral where $\leq 660'$ from section line

RCVD NOV 17 06
OIL CONS. DIV.

14. I hereby certify that the foregoing is true and correct
Name (Printed/Typed)

Lynn H. Benally

Title Regulatory Compliance Coordinator

Signature

Date

9-05-06

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by (Signature)

Name
(Printed/Typed)

Title

Date

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

Acting AFM
Munoz
11/16/06

RCVD NOV17'06
OIL CONS. DIV.
DIST. 3

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
DISTRICT II
1301 W. Grand Ave., Artesia, N.M. 88210
DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410
DISTRICT IV
1220 South St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-10
Revised October 12, 200
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-039-		*Pool Code 72400	*Pool Name E. BLANCO / PICTURED CLIFFS
*Property Code 35770	*Property Name MANY CANYONS 30-04-12		*Well Number 24H
*OGRID No. 013925	*Operator Name BLACK HILLS GAS RESOURCES		*Elevation 7028'

10 Surface Location

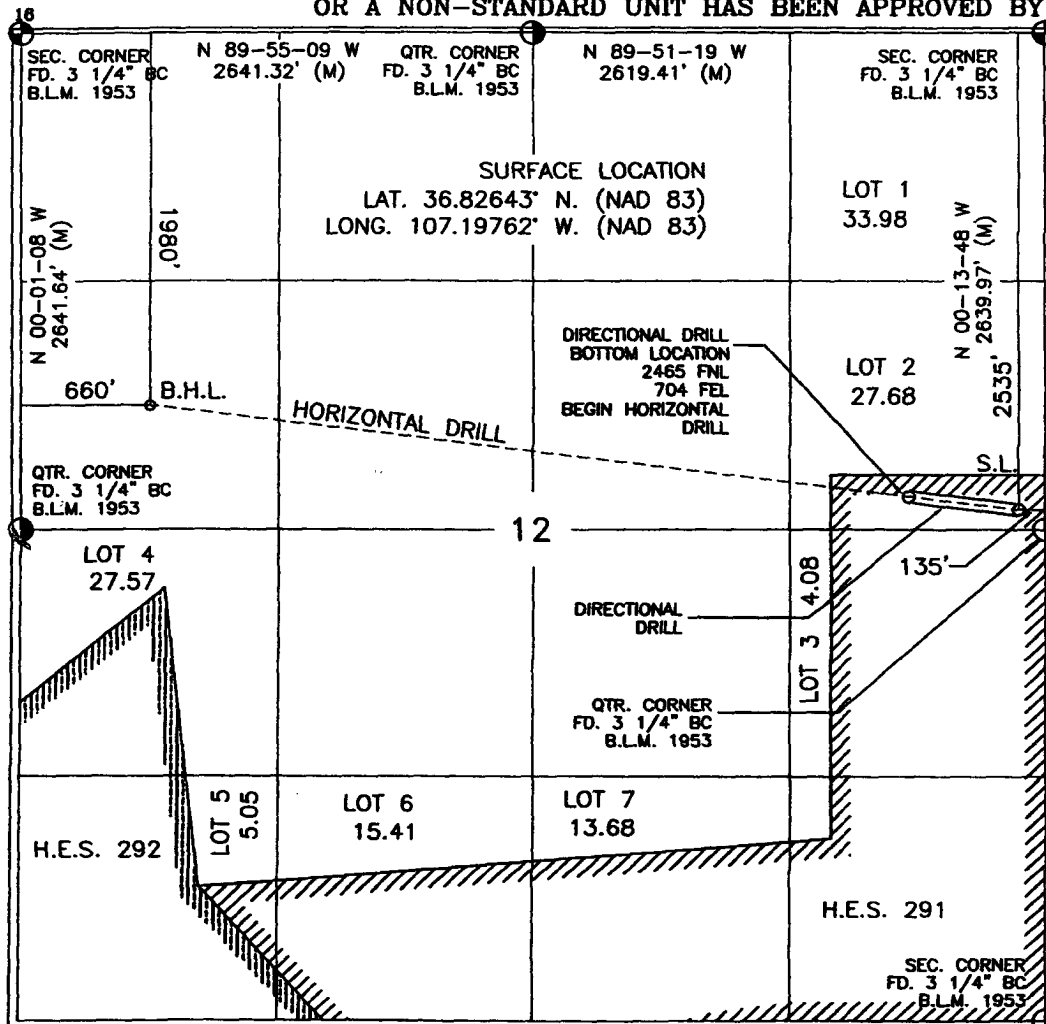
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	12	30-N	4-W		2535	NORTH	135	EAST	RIO ARRIBA

11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	12	30-N	4-W		1980	NORTH	660	WEST	RIO ARRIBA

*Dedicated Acres 320 - N/2	*Joint or Infill	*Consolidation Code	*Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Daniel Manus 9-05-06
Signature Date
Daniel Manus
Printed Name

18 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

AUGUST 30, 2006
Date of Survey
Signature and Seal of Professional Surveyor:
8894
Certificate Number

Black Hills Gas Resources (BHGR)
Many Canyons 30-04-12 #24
Surface Location: 960' FNL 135' FEL (SE/NE)
Bottom Hole Location: 1980' FNL 660' FWL (SW/NW)
Sec.12 T30 R4W
Rio Arriba County, New Mexico
NMSF79484A

DRILLING PROGRAM
(Per Rule 320)

This Application for Permit to Drill (APD) was initiated under the NOS process as stated in Onshore Order No. 1 and supporting Bureau of Land Management (BLM) documents. This APD process includes an onsite meeting which was held on February 7, 2006 as determined by Bureau of Land Management (BLM) and Carson National Forest Service, at which time the specific concerns of Black Hills Gas Resources (BHGR) were discussed.

This well was originally permitted and approved as a vertical PC well. This new drilling plan addresses changing the un-drilled well to a directional well then a horizontal PC well.

SURFACE FORMATION – San Jose

GROUND ELEVATION – 7,028'

ESTIMATED FORMATION TOPS - (Water, oil, gas and/or other mineral-bearing formations)

San Jose	Surface	Sandstone, shales & siltstones
Nacimiento	1,890'	Sandstone, shales & siltstones
Ojo Alamo	3,115'	Sandstone, shales & siltstones
Kirtland	3,325'	Sandstone, shales & siltstones
Fruitland Coal	3,510'	Sandstone, shales & siltstones
Pictured Cliffs	3,681'	Sandstone, shales & siltstones

TOTAL DEPTH	4,000'	TVD
	4,519'	Vertical Length of Bore

Estimated depths of anticipated fresh water, oil, or gas:

Tertiary

San Jose	surface	Gas
Nacimiento	1,890'	Gas
Ojo Alamo	3,115'	Gas
Fruitland Coal	3,510'	Gas
Pictured Cliffs	3,681'	Gas

HORIZONTAL DRILLING PROGRAM

Kick Off Point is estimated to be $\pm 1713'$ TVD

CASING PROGRAM

Depth	Hole Diameter	Casing Diameter	Casing Weight and Grade	Cement
0-250' TVD	12-1/4"	8 5/8"	J-55 24# ST&C New	To surface (± 175 sxs Standard cement containing 2% CaCl_2 and 0.25lb/sx LCM) **
0-4000' TVD	7-7/8"	5 1/2 "	J-55 15.5# LT&C New	TD to surface (Lead: ± 300 sxs lite standard cement. Tail: 400 sxs 50:50 poz containing 0.25 lb/sx LCM) * **
1713' TVD (KOP) End of Lateral Bore	4-3/4"	2-7/8"	PH-6 Liner	None

* Actual cement volume to be determined by caliper log.

** Cement will be circulated to surface

Yields:

Surface: Standard cement yield = $1.2 \text{ ft}^3/\text{sx}$ (mixed at 15.6 lb/gal)

Production: Lite Standard Cement yield: = $1.59 \text{ ft}^3/\text{sx}$ (mixed at 13.4 lb/gal)
50:50 poz yield = $1.27 \text{ ft}^3/\text{sx}$ (mixed at 14.15 lb/gal)

All fresh water and prospectively valuable minerals encountered during drilling will be recorded by depth and protected.

PRESSURE CONTROL

BOPs and choke manifold will be installed and pressure tested before drilling out under surface casing (subsequent pressure test will be performed whenever pressure seals are broken), and then will be checked daily as to mechanical operating conditions. BOP's will be pressure tested at least once every 30 days. Ram type preventors and related pressure control equipment will be pressure tested to 1,000 psi. Annular type preventor will be pressure tested to 50% of the rated working pressure, not to exceed 1,000 psi. All casing strings will be pressure tested to 0.22 psi/ft. or 1,000 psi, whichever is greater, not to exceed 70% of internal yield.

BOP to be either double gate rams or an annular preventor as per Onshore Order No. 2.

Statement on Accumulator System and Location of Hydraulic Controls

The drilling rig has not yet been selected for this well. Selection will take place after approval of this application. Manual and/or hydraulic controls will be in compliance with Onshore Order No. 2 for 2M systems.

A remote accumulator will be used. Pressures, capacities, location of remote hydraulic and manual controls will be identified at the time of the BLM supervised BOP test.

MUD PROGRAM

0'	-	300'	Fresh water – M.W. 8.5 ppg, Vis 30-33
300'	-	TD'	Clean Faze - Low solids non-dispersed
			M.W. 8.5 – 9.2 ppg
			Vis – 28 – 50 sec
			W.L. 15cc or less

Sufficient mud materials to maintain mud properties, control lost circulation and to contain “kick” will be available at well site.

AUXILIARY EQUIPMENT

- A) A Kelly cock will be kept in the drill string at all times
- B) Inside BOP or stab-in valve (available on rig floor)
- C) Mud monitoring will be visually observed

LOGGING, CORING, TESTING PROGRAM

- A) Logging: DIL- CNL-FDC-GR - TD - BSC (GR to surface)
Sonic (BSC to TD)
- B) Coring: None
- C) Testing: Possible DST – None anticipated. Drill stem tests may be run on shows of interest

ABNORMAL CONDITIONS

- A) Pressures: No abnormal conditions are anticipated
Bottom hole pressure gradient – 0.31 psi/ft
- B) Temperatures: No abnormal conditions are anticipated
- C) H₂S: See attached H₂S plan in event H₂S is encountered.
- D) Estimated bottomhole pressure: 1,240 psi

ANTICIPATED START DATE

October 1, 2006

COMPLETION

The location pad will be of sufficient size to accommodate all completion activities and equipment. A string of 2-7/8” PH-6 tubing will be run for a flowing string. A Sundry Notice will be submitted with a revised completion program if warranted.



1724-B Townhurst Dr, Houston, Tx 77043
(713) 827-8302
www.nevisenergy.com

Job Number: 206-xxx
Company: BHEP
Lease/Well: Many Canyons 30-04-12 #24H
Location: Rio Arriba Co., NM
Rig Name: ☐
RKB: ☐
G.L. or M.S.L.: ☐

State/Country: NM/USA
Declination: ☐
Grid: ☐
File name: N:\BLACKH-1\2006\WELLPL-1\MC30-0-3\30041224
Date/Time: 16-Aug-06 / 11:10
Curve Name: Pilot Hole Plan

WINSERVE PROPOSAL REPORT
Minimum Curvature Method
Vertical Section Plane 277.05
Vertical Section Referenced to Wellhead
Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	C L O S U R E Distance FT	Direction Deg	Dogleg Severity Deg/100
KOP-> 1713 TVD' Begin Build @ 2.50°/ 100' (135' FEL & 2535' FNL)									
1712.75	.00	277.05	1712.75	.00	.00	.00	.00	.00	.00
1742.75	.75	277.05	1742.75	.20	.02	-.19	.20	277.05	2.50
1772.75	1.50	277.05	1772.74	.79	.10	-.78	.79	277.05	2.50
1802.75	2.25	277.05	1802.73	1.77	.22	-1.75	1.77	277.05	2.50
1832.75	3.00	277.05	1832.69	3.14	.39	-3.12	3.14	277.05	2.50
1862.75	3.75	277.05	1862.64	4.91	.60	-4.87	4.91	277.05	2.50
1892.75	4.50	277.05	1892.56	7.06	.87	-7.01	7.06	277.05	2.50
1922.75	5.25	277.05	1922.46	9.61	1.18	-9.54	9.61	277.05	2.50
1952.75	6.00	277.05	1952.31	12.55	1.54	-12.46	12.55	277.05	2.50
1982.75	6.75	277.05	1982.13	15.89	1.95	-15.77	15.89	277.05	2.50
2012.75	7.50	277.05	2011.89	19.61	2.41	-19.46	19.61	277.05	2.50
2042.75	8.25	277.05	2041.61	23.72	2.91	-23.54	23.72	277.05	2.50
2072.75	9.00	277.05	2071.27	28.22	3.46	-28.00	28.22	277.05	2.50
2102.75	9.75	277.05	2100.87	33.10	4.06	-32.85	33.10	277.05	2.50
2132.75	10.50	277.05	2130.40	38.38	4.71	-38.09	38.38	277.05	2.50
2162.75	11.25	277.05	2159.86	44.04	5.40	-43.70	44.04	277.05	2.50
2192.75	12.00	277.05	2189.25	50.08	6.15	-49.70	50.08	277.05	2.50
2222.75	12.75	277.05	2218.55	56.51	6.94	-56.08	56.51	277.05	2.50
2252.75	13.50	277.05	2247.77	63.32	7.77	-62.84	63.32	277.05	2.50
2282.75	14.25	277.05	2276.89	70.52	8.66	-69.98	70.52	277.05	2.50
2312.75	15.00	277.05	2305.92	78.09	9.58	-77.50	78.09	277.05	2.50
2342.75	15.75	277.05	2334.85	86.05	10.56	-85.40	86.05	277.05	2.50
2372.75	16.50	277.05	2363.66	94.38	11.58	-93.66	94.38	277.05	2.50

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
2402.75	17.25	277.05	2392.37	103.09	12.65	-102.31	103.09	277.05	2.50
2432.75	18.00	277.05	2420.96	112.17	13.77	-111.32	112.17	277.05	2.50
2462.75	18.75	277.05	2449.43	121.63	14.93	-120.71	121.63	277.05	2.50
2492.75	19.50	277.05	2477.78	131.46	16.13	-130.46	131.46	277.05	2.50
Begin Hold @ 20.00°, 277.05° Azm									
2512.75	20.00	277.05	2496.60	138.21	16.96	-137.17	138.21	277.05	2.50
2612.75	20.00	277.05	2590.57	172.42	21.16	-171.11	172.42	277.05	.00
2712.75	20.00	277.05	2684.54	206.62	25.36	-205.06	206.62	277.05	.00
2812.75	20.00	277.05	2778.51	240.82	29.56	-239.00	240.82	277.05	.00
2912.75	20.00	277.05	2872.48	275.02	33.76	-272.94	275.02	277.05	.00
3012.75	20.00	277.05	2966.45	309.22	37.95	-306.89	309.22	277.05	.00
3112.75	20.00	277.05	3060.42	343.43	42.15	-340.83	343.43	277.05	.00
3212.75	20.00	277.05	3154.39	377.63	46.35	-374.77	377.63	277.05	.00
3312.75	20.00	277.05	3248.36	411.83	50.55	-408.72	411.83	277.05	.00
3412.75	20.00	277.05	3342.33	446.03	54.74	-442.66	446.03	277.05	.00
3512.75	20.00	277.05	3436.29	480.23	58.94	-476.60	480.23	277.05	.00
3612.75	20.00	277.05	3530.26	514.44	63.14	-510.55	514.44	277.05	.00
3712.75	20.00	277.05	3624.23	548.64	67.34	-544.49	548.64	277.05	.00
Top PC - 700' FEL & 2465' FNL									
3773.16	20.00	277.05	3681.00	569.30	69.87	-565.00	569.30	277.05	.00
3873.16	20.00	277.05	3774.97	603.50	74.07	-598.94	603.50	277.05	.00
PBHL @ 3781' TVD - Top Lewis									
3879.58	20.00	277.05	3781.00	605.70	74.34	-601.12	605.70	277.05	.00



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Job Number: 206-xxx
Company: BHEP
Lease/Well: Many Canyons 30-04-12 #24H
Location: Rio Arriba Co., NM
Rig Name: ☐
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G.L. or M.S.L.: ☐

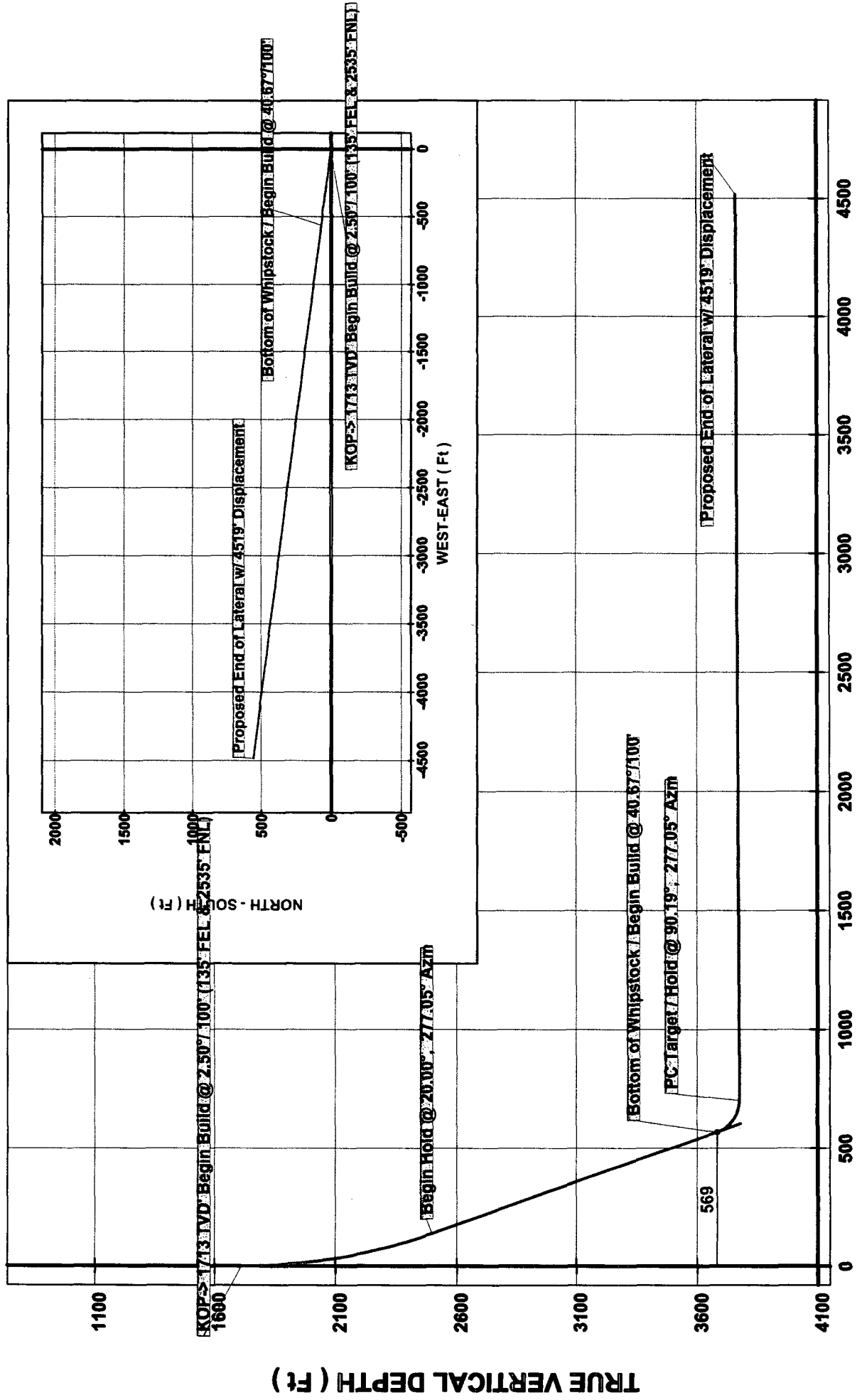
State/Country: NM/USA
Declination: ☐
Grid: ☐
File name: N:\BLACKH-1\2006\WELLPL-1\MC30-0-3\3004122
Date/Time: 16-Aug-06 / 11:32
Curve Name: Lateral Plan

WINSERVE PROPOSAL REPORT
Minimum Curvature Method
Vertical Section Plane 277.05
Vertical Section Referenced to Wellhead
Rectangular Coordinates Referenced to Wellhead

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	CLOSURE Distance FT	Direction Deg	Dogleg Severity Deg/100
Bottom of Whipstock / Begin Build @ 40.67°/100'									
3773.16	20.00	277.05	3681.00	569.30	69.87	-565.00	569.30	277.05	.00
3803.16	32.20	277.05	3707.89	582.47	71.49	-578.07	582.47	277.05	40.67
3833.16	44.40	277.05	3731.39	601.03	73.77	-596.49	601.03	277.05	40.67
3863.16	56.60	277.05	3750.43	624.14	76.61	-619.42	624.14	277.05	40.67
3893.16	68.80	277.05	3764.17	650.75	79.87	-645.83	650.75	277.05	40.67
3923.16	81.00	277.05	3771.97	679.66	83.42	-674.52	679.66	277.05	40.67
PC Target / Hold @ 90.19°, 277.05° Azm									
3945.75	90.19	277.05	3773.70	702.16	86.19	-696.85	702.16	277.05	40.67
4000.00	90.19	277.05	3773.52	756.41	92.85	-750.69	756.41	277.05	.00
4100.00	90.19	277.05	3773.19	856.41	105.13	-849.93	856.41	277.05	.00
4200.00	90.19	277.05	3772.86	956.41	117.41	-949.17	956.41	277.05	.00
4300.00	90.19	277.05	3772.52	1056.41	129.70	-1048.41	1056.41	277.05	.00
4400.00	90.19	277.05	3772.19	1156.40	141.98	-1147.66	1156.40	277.05	.00
4500.00	90.19	277.05	3771.86	1256.40	154.26	-1246.90	1256.40	277.05	.00
4600.00	90.19	277.05	3771.53	1356.40	166.54	-1346.14	1356.40	277.05	.00
4700.00	90.19	277.05	3771.20	1456.40	178.82	-1445.38	1456.40	277.05	.00
4800.00	90.19	277.05	3770.87	1556.40	191.11	-1544.63	1556.40	277.05	.00
4900.00	90.19	277.05	3770.53	1656.40	203.39	-1643.87	1656.40	277.05	.00
5000.00	90.19	277.05	3770.20	1756.40	215.67	-1743.11	1756.40	277.05	.00
5100.00	90.19	277.05	3769.87	1856.40	227.95	-1842.35	1856.40	277.05	.00
5200.00	90.19	277.05	3769.54	1956.40	240.23	-1941.59	1956.40	277.05	.00
5300.00	90.19	277.05	3769.21	2056.40	252.52	-2040.84	2056.40	277.05	.00

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	Vertical Section FT	N-S FT	E-W FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
5400.00	90.19	277.05	3768.88	2156.40	264.80	-2140.08	2156.40	277.05	.00
5500.00	90.19	277.05	3768.55	2256.40	277.08	-2239.32	2256.40	277.05	.00
5600.00	90.19	277.05	3768.21	2356.40	289.36	-2338.56	2356.40	277.05	.00
5700.00	90.19	277.05	3767.88	2456.40	301.64	-2437.81	2456.40	277.05	.00
5800.00	90.19	277.05	3767.55	2556.40	313.93	-2537.05	2556.40	277.05	.00
5900.00	90.19	277.05	3767.22	2656.40	326.21	-2636.29	2656.40	277.05	.00
6000.00	90.19	277.05	3766.89	2756.40	338.49	-2735.53	2756.40	277.05	.00
6100.00	90.19	277.05	3766.56	2856.40	350.77	-2834.78	2856.40	277.05	.00
6200.00	90.19	277.05	3766.22	2956.39	363.05	-2934.02	2956.39	277.05	.00
6300.00	90.19	277.05	3765.89	3056.39	375.34	-3033.26	3056.39	277.05	.00
6400.00	90.19	277.05	3765.56	3156.39	387.62	-3132.50	3156.39	277.05	.00
6500.00	90.19	277.05	3765.23	3256.39	399.90	-3231.74	3256.39	277.05	.00
6600.00	90.19	277.05	3764.90	3356.39	412.18	-3330.99	3356.39	277.05	.00
6700.00	90.19	277.05	3764.57	3456.39	424.46	-3430.23	3456.39	277.05	.00
6800.00	90.19	277.05	3764.23	3556.39	436.75	-3529.47	3556.39	277.05	.00
6900.00	90.19	277.05	3763.90	3656.39	449.03	-3628.71	3656.39	277.05	.00
7000.00	90.19	277.05	3763.57	3756.39	461.31	-3727.96	3756.39	277.05	.00
7100.00	90.19	277.05	3763.24	3856.39	473.59	-3827.20	3856.39	277.05	.00
7200.00	90.19	277.05	3762.91	3956.39	485.87	-3926.44	3956.39	277.05	.00
7300.00	90.19	277.05	3762.58	4056.39	498.16	-4025.68	4056.39	277.05	.00
7400.00	90.19	277.05	3762.24	4156.39	510.44	-4124.93	4156.39	277.05	.00
7500.00	90.19	277.05	3761.91	4256.39	522.72	-4224.17	4256.39	277.05	.00
7600.00	90.19	277.05	3761.58	4356.39	535.00	-4323.41	4356.39	277.05	.00
7700.00	90.19	277.05	3761.25	4456.39	547.28	-4422.65	4456.39	277.05	.00
Proposed End of Lateral w/ 4519' Displacement									
7762.82	90.19	277.05	3761.04	4519.21	555.00	-4485.00	4519.21	277.05	.00

Job Number: 206-xxx
 Company: BHEP
 Lease/Well: Many Canyons 30-04-12 #24H
 Location: Rio Arriba Co., NM



VERTICAL SECTION (Ft) @ 277.05°

Many Canyons 30-04-12 #24
 2535' FNL 135' FWL (SE /4 NE /4) Surface Location
 2465' FNL 704' FWL (SE /4 NE /4) Bottom Of Directional Bore
 Sec. 12 T 30 R 4
 Rio Arriba County, New Mexico
 NMSF79484A and Fee Surface

SURFACE CASING AND CENTRALIZER DESIGN

Proposed Total Depth: 4,000 '
 Proposed Depth of Surface Casing: 250 '
 Estimated Pressure Gradient: 0.31 psi/ft
 Bottom Hole Pressure at 4,000 '
 0.31 psi/ft x 4,000 ' = 1,240 psi
 Hydrostatic Head of gas/oil mud: 0.22 psi/ft
 0.22 psi/ft x 4,000 ' = 880 psi

Maximum Design Surface Pressure

Bottom Hole Pressure – Hydrostatic Head =
 (0.31 psi/ft x 4,000 ') – (0.22 psi/ft x 4,000 ') =
 1,240 psi – 880 psi = 360 psi

Casing Strengths 8 5/8 J-55 24# ST&C

Wt.	Tension (lbs)	Burst (psi)	Collapse (psi)
24 #	244,000	2,950	1,370
32 #	372,000	3,930	2,530

Safety Factors

Tension (Dry):	1.8	Burst:	1.0	Collapse:	1.125
Tension (Dry):	24 # / ft x	250 ' =	6,000 #		
	Safety Factor =	$\frac{244,000}{6,000}$	= 40.67	ok	
Burst:	Safety Factor =	$\frac{2,950 \text{ psi}}{360 \text{ psi}}$	= 8.19	ok	
Collapse:	Hydrostatic =	0.052 x 9.0 ppg x	250 ' =	117 psi	
	Safety Factor =	$\frac{1,370 \text{ psi}}{117 \text{ psi}}$	= 11.71	ok	

Use 250 ' 8 5/8 J-55 24# ST&C

Use 2,000 psi minimum casinghead and BOP's but will test to 1,000 psi

Centralizers

5 Total
 1 near surface at 40'
 2 -1 each at middle of bottom joint, second joint
 2 -1 each at every other joint 40' spacing
 Total centralized ± 200 ' (50 ' – 250 ')

Note that field experience indicates that additional centralizers greatly increase the chance of "sticking" the surface casing prior to reaching surface casing total depth.